

Turtle Survival: What Are The Odds?

Hook: Introduction to Odds

- Ask students to define the meaning of the word *chance*.
- For example, what does chance mean in terms of *There is a good chance it's going to rain today*? Does this mean the likelihood is about 30%? Are the odds more like 50/50? Or does it mean there is more than a 50% probability of rain? (The answer is more than 50%.)
- Explain that the chance of some creatures surviving to adulthood is greater than others because of various factors that affect the survival of a species throughout various life stages. As well, some individuals in a population will face more challenges than others, thereby reducing their survival rate. Others will have an average chance of survival, like most members of its species. A few will survive with very little risk.
- For example, think about the factors that can affect a fawn's survival:
 - birth month
 - weather at birth
 - disease
 - predators
 - health of mother before, during and after pregnancy
 - is the fawn a twin?
- Ask each student to write down their estimation (percentage) of the odds for a turtle egg surviving to adulthood? At end of activity, check to see who guessed right – or came close!

Hands-on Activity: Chances of Survival

1. Provide each student with *Chances of Survival* worksheet and *Ontario Turtles Info Sheet*.
2. Have students complete the questions on the worksheet. Before allowing students to begin, explain that the chances of an individual egg or turtle at a certain location at a given time might be anywhere from 0 to 100%, depending on such factors as whether a predator happens by. For this exercise, however, we will be assuming a reasonable given chance of survival for our group of turtles at each life stage.
3. Take up answers and discuss.



Age range: 8 to 12

Time: Two 60-minute periods

Themes: Threats facing at-risk turtle species through each life stage and the critical importance of human assistance in turtle survival.

Resources:

- class set of worksheets *Chances of Survival*
- class set of worksheets *Ontario Turtles Info Sheet*
- *Up Against the Odds* script for teacher
- pencils
- space for role-play (preferably outdoors)
- props for role-play
- turtle ID sheets
- life-size turtle models

For Extension:

- computer lab loaded with Adobe Flash Player

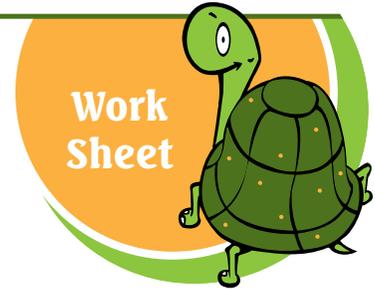
Learning Outcome:

Students investigate the survival rates of turtles throughout various stages of life by participating in a role-play activity and completing a math-based worksheet.



Name: _____

Chances of Survival?



Most Ontario turtle species usually lay about 10 to 20 eggs per year. Sometimes they lay eggs in two batches, a week or more apart. For this exercise, however, we are going to pretend that our adult female turtle has laid 100 eggs

Life Stage 1: Egg

1a) The survival of a turtle egg depends on such factors as location, predators and other disturbances. We estimate that 38% of our 100 eggs will not survive. How many eggs are left? Explain your thinking. Use pictures and numbers.

38% of 100 = **1A**

1b) List five turtle egg predators.

- i) _____
- ii) _____
- iii) _____
- iv) _____
- v) _____

1c) List two other reasons why turtle eggs could be destroyed (hint: consider natural and human-made disturbances).

- i) _____
- ii) _____

1d) In what type of soil do turtles like to lay their eggs?

1e) What time of year do turtles lay their eggs?

Life Stage 2: Hatchling

2a) The survival rate of a turtle hatchling in search of water depends on it whether it can escape predators. If 32% of our hatchlings are successful in reaching the pond, how many are left? Round out your answer. Explain your thinking. Use pictures and numbers.

32% of **1A** = **2A**

2b) List 3 large birds that might eat baby turtles.

- i) _____
- ii) _____
- iii) _____

2c) List 3 animals that might eat baby turtles.

i) _____

ii) _____

iii) _____

Life Stage 3: Youth

3a) Turtles must spend many years avoiding predators. Their small size in the first few years makes them vulnerable to bird and animal predators. If 50% of our surviving hatchlings survive their youth, how many will reach adulthood? Explain your thinking. Use pictures and numbers.

50% of 2A = 3A

3b) In what habitat do most turtles spend their youth?

3c) List or illustrate three predators that also live in these habitats.

i) _____

ii) _____

iii) _____

Life Stage 4: Maturity and Mating

4) Turtles must find a mature mate of the same species. While this may not be possible every year, it won't impact our survival numbers for this exercise.

Life Stage 5: Laying Eggs

5) Pregnant turtles sometimes travel significant distances to find suitable nesting areas. Along the way, they often cross roads, where cars kill the majority of turtles. Assuming that all our remaining turtles are female and that 90% of female turtles that travel overland are killed on roads, how many of our turtles will survive? Explain your thinking. Use pictures and numbers.

90% of 3A = FINAL ANSWER

What We Can Do

6a) How surprised are you that only one out of every 100 turtles survives from egg through adulthood?

6b) What do these odds tell us about the importance of every turtle and why we should help save their species?

7a) **Habitat protection** and **conservation** are two of the most important factors in preventing Ontario turtle species from becoming extinct. What do you think these terms mean?

7b) What can each of us do to protect turtle habitat?

8. What can you do to prevent your dog from digging up and destroying turtle eggs?

9. Is it a good idea to collect turtles for pets? Why or why not?

10. Traffic on Ontario's roads and highways is a major cause of turtle deaths. List three things we can do to help turtles as they cross our roads..

- i)

- ii)

- iii)

11. List five effective methods/media we can use to teach others about protecting Ontario turtle species..

- i)

- ii)

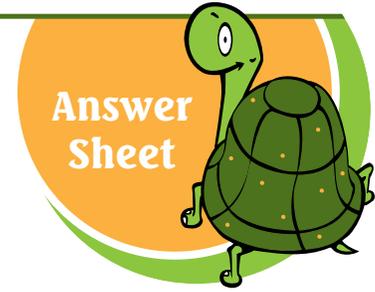
- iii)

- iv)

- v)



Chances of Survival?



- 1a) 62
- 1b) skunks, pet dogs, racoons, foxes, wolves, otters, wolverines
- 1c) floods, heavy equipment crushes or digs up eggs, temperature of surrounding soil too hot or cold
- 1d) sandy, gravel, soft
- 1e) May, June, July
- 2a) 20
- 2b) seagulls, hawks, turkey vultures
- 2c) skunks, otters, dogs, racoons, foxes, wolves, coyotes, bears
- 3a) 10
- 3b) ponds, wetlands, lakes, rivers
- 3c) otters, large fish, bear, raccoon
- 4) No answer.
- 5) 1
- 6a) individual answers
- 6b) The loss of each turtle is a blow that brings the entire species closer to being gone (eliminated/extinct) – forever.
- 7a) Habitat protection means setting aside a wilderness area away from human contact so that wildlife and plant species can survive and recover. Conservation of habitat means that the wetlands and forests in question are allowed to be used only for certain things, such as walking, bird watching, hunting and ATVs.
- 7b) We can designate our own land as protected or conserved habitat zones. We can donate to organizations that protect turtle habitat and wilderness areas. We can avoid polluting our wetlands and forests. We can avoid disturbing turtles.
8. Dogs should not be allowed to run free as they like to dig up and destroy turtle eggs.
9. Do not collect turtles for pets. They need to remain in the wild to reproduce.
10. Do your best to avoid hitting turtles with your vehicle. If you are able, carry the turtle off the road in the direction it was travelling. Even better, transport it to the safety of a nearby wetland (again, in the direction it was travelling). This will most likely mean the difference between life and death for that turtle.
11. Talk to others about habitat protection, leashing pet dogs, and especially making an effort to avoid hitting turtles on roads and how to assist them to the side or to a nearby wetland if possible.
 - put ads on the radio
 - put ads on tv
 - launch a website
 - make turtle education part of school
 - make a pamphlet and distribute it
 - make posters

Role-play Activity: Up Against the Odds

Important: This activity is based on 25 to 30 participants or turtles. Modify the number of turtles that perish at each stage according to the number of participants in the group.

Studies show that there is an extremely low chance - 1 percent - of a turtle surviving from egg to adulthood, which means that only 1 of every 100 turtles survives. This means that in our exercise, where we start out with 25 to 30 eggs, the chances of any making it to adulthood and successfully reproducing is statistically zero. This will become clear to participants by the end of the exercise.

1. Clear an area – preferably outside – where participants can act out the script. If inside, accompany the activity with recorded nature sounds when possible.
2. Gather the group at one end of the space.
3. Explain to the students they are now going to use their imagination to act out the life stages of a turtle from egg through adulthood.
4. Read the script aloud, pausing to allow the students to act out their roles.
5. Afterwards, talk about what this activity has taught the class about the odds of turtle survival. How surprised are they that perhaps only one turtle survived? If your class has 25 students, and one turtle did indeed survive, compare its survival rate (4%) compared to the average: 1 in 100 = 1 percent? How does this figure compare to the survival rate the students each recorded at the start of this lesson?
6. Reinforce how important it is that we all do our part to help turtles survive. Explain that with such low odds of a turtle surviving from egg through adulthood, every turtle counts. The loss of each adult turtle is significant blow that brings the entire species closer to extinction – forever. Discuss what we can do to ensure turtles – who have lived on Earth for tens of thousands of years – continue to survive (see Backgrounder).

Script: Up Against the Odds - The Lifecycle of a Turtle

You are now beginning life as a turtle.

Your life begins inside an egg, so crouch down into a ball and stay very still and quiet.

You are completely defenceless.

After you have been incubating in the warm sandy soil for a few days, a hungry raccoon comes by, but he is chased off by a pet dog that someone has let run loose in the forest.

The dog sniffs at all the eggs in your nest. He digs up six eggs and eats them.

(Leader acts as the dog and moves among the eggs and pats six heads.)

These 'eaten' eggs move to the side and encircle the remaining eggs.)



Now you have grown into a tiny turtle, hatching from your shell.

You burrow out of the sandy soil to reach the air.

You are only the size of a Loonie (*a Canadian one dollar coin*).

Use your nose to detect the scent of pond water and move towards it.

Take tiny steps (*on hands and knees*) but walk as quickly as you can to the safety of the pond.

Look out! A flock of seagulls has spotted you!



(Two of the participants from the side act as predators, encircling and swooping among the hatchlings, then 'eating' ten hatchlings by bringing them by the arm to the outer circle – 16 in all have not survived.)



Finally! You have made it to the pond where it's safer.
But most days are very scary for you in these first few years because you are so small.
You swim around looking for food, but keep on the lookout for predators.
You see some large objects in the water and scurry down to hide among the mud and rocks.
It's a pair of hungry otters!

(Two of the encircling predators chase two baby turtles and eat them, bringing them to join the outer group, which now totals 18.)



Now you are an adult female turtle who has survived many years in the pond.
You eat bugs and worms and grow bigger every year.
But it is turtle season.
You are pregnant and it's time to find a suitable place to lay your eggs.
You look for loose soil or sand, close to your pond.
But the ground here is not suitable, so you crawl *(on hands and knees)* overland in search of a better place.
Soon you come to a flat, smooth warm area. You don't know it, but this is a road, full of noisy, fast-moving traffic.
(The outer group sets up a road in front of the female turtle group, making traffic sounds and going quickly back and forth.)



As a turtle, you do not realize these huge vehicles are a danger to you.
Your instincts force you to move forward across the road in a continued search for loose soil in which to lay your eggs.
You keep moving across the road.
(Leader of the role-play ensures all but one turtle gets hit by a car. The dead turtles join the other 'cars' as they get hit.)



You are the only surviving turtle from your birth group.
Move toward the sandy patch of soil and deposit your eggs.
If you are lucky, you will now successfully travel back to your pond or to a new one.
As an adult turtle you will be relatively safe here until next turtle season, when you will have to set out to lay your eggs again.

Extension

Students can go online to learn more about the challenges turtles face in their lifecycle by playing the interactive game: **Survivor Turtle – The 1% Challenge**.
<http://www.bonnecherepark.on.ca/html/programs/resources-turtles.html>

